Time for Technology

Footbath Innovation

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It is common knowledge on the dairy farm that having a footbath in the return lane from the milking parlor is an important element in preventing lameness. As technology goes, a foot bath should be quite a simple thing. After all, a concrete or plastic basin 3 feet wide, 10 feet long and 6 inches deep filled to the 5 inch mark with a mixture of water and one of three or four chemical agents that disinfect and dry and harden hooves, is hardly rocket science.

But as it turns out "common knowledge" can be painfully incorrect. In fact a research study conducted on Dutch dairy farms concluded that "having a footbath on the farm" increased the likelihood of lameness in dairy herds. (Amory et.al. J.Dairy Sc. 89:1509). In another study, researchers in Minnesota surveyed American dairy farms and found that "using a footbath on the farm" had no effect on the incidence of lameness. (Espejo and Endres, J.Dairy Sc. 90:306). Yet most of us remain convinced that strategic footbathing is an effective tool in improving foot health and reducing lameness problems. The fact that "having a footbath" is a bad thing, and "using a footbath" is an ineffective thing, serves as a reminder that this is a tool that has to be used right, or you are better off without it. Although I have no proof, I suspect that "having a footbath" was a bad thing in the Dutch study, because more often than not it was full of manure, and that "using a footbath" in the USA, was ineffective because the manure contaminated solution was unable to do its job.

First and foremost these findings should remind us to stay on top of footbath management. Keeping a permanent bath clean and removing a temporary one, when not in use, is likely as critical to success as using it properly. For permanently installed concrete baths, perhaps a rubber covered filler that brings the floor back to level, or a split return lane that diverts cows around it, should be considered. Taking steps to keep the solution clean, and replacing it when it gets dirty are also important components in footbath management. One guideline I have seen suggests that if manure contamination is kept to a minimum, chemicals lose their effectiveness at a rate of 1 cow per liter. A bath that is 10 feet long, 3 feet wide filled to a depth of 5 inches holds about 400 liters, and it will treat about 400 cows. To minimize manure contamination a "pre-bath" of water with the same dimensions should be placed ahead of the footbath. This

water bath washes the worst manure off the feet of the cows and if they plan to defecate on the way through they usually do it in the water bath.

But all this need for management means extra labour. If this labour is not applied the results can be worse than doing nothing, and so, what was once a simple rectangular concrete depression in the floor, becomes a thing of technology. Most milking equipment manufacturers can sell you an automated footbath that fills and cleans on a pre-programmed cycle. While this may cost more than doing it manually it does ensure that the job gets done right, and at the right time.

On a recent visit to Eurotier, one of the major agricultural trade shows in Europe, I was surprised to see several innovative approaches to footbathing that might make future research results more positive. One interesting footbath was the Vink Hydromatic www.vink-elst.nl which features two channels the cow walks in separated by a raised grate. This design is supposed to slow the cow down for better contact time. The center grate also keeps a lot of manure out of the solution. The cow's feet are washed by a sprayer with jets that spray the solution against the bottom and back of the hooves. Manure solids are removed by a sieve and the solution is collected in a holding tank that is continuously topped up from a reservoir. Puli-system, from Italy exhibited its Puli-sistem Footbrush www.puli-sistem.com which takes active hoof cleaning a step further. This footbath has three stages. The first is a stationary water bath that is flushed and cleaned at regular intervals, next is a water bath with brushes protruding through a grate that physically cleans the hooves, and last there is a stationary bath with chemicals. But the most interesting of them all was a system developed by a German company, Schmidt Land & Gardentechnik schmidtgt@t-online.de . This system is a metal, elevated, single lane chute consisting of three sections with grated floors. The entire floor area is equipped with powered rotating brushes that protrude through long and narrow openings in the grate. As the cow walks through it, the brushes in the first two sections clean the bottom, the cleft and the rear of the hoof. Manure spins off into pit below the device. In the third section, brushes rotate in a bath of chemical solution located below the grate. Solution is applied directly to the soft tissue and cleft, resulting in minimal wastage. The solution stays clean longer because hooves are cleaned in the first two sections. According to the manufacturer, cows need some training to use the system but they like it once they are used to it. Next steps for these innovations will include getting some on farm experience and critical evaluations in some of the practical testing centers. If you happen to read German, researcher Dietrich Landmann at LVA Echem has already begun an evaluation of the Schmidt device and has an article posted at www.lwk-niedersachsen.de/index.cfm/portal/lvaechem/nav/420/article/11187.html

And so a simple 10 x 3 concrete depression in the floor of the return lane has begun to evolve into an intricate automated device with brushes, valves and programmable software. Madness perhaps, but interesting none the less. When it comes to footbathing, whether we invest in new innovations or just learn to manage existing technology better, doing it right, and doing it consistently are important steps in improving foot health in the dairy herd.